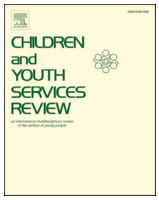
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Promoting personal and social skills in youth with disruptive behaviors: A systematic review of tertiary programs

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ABSTRACT

Disruptive behavior in youth (i.e., persistent oppositional, aggressive, or delinquent conduct) predicts harm to self and others, as well as long-term social exclusion. Tertiary, skill-oriented programs aim to prevent the escalation of these behaviors and strengthen personal and social skills. However, an up-to-date, comprehensive synthesis of their effectiveness is still lacking. In accordance with PRISMA 2020, we searched Web of Science, Scopus, PubMed, ProQuest, and B-on. Studies included justice-involved, school-referred, community, and/or mixed-setting. Overall, 43 peer-reviewed studies (January 2013–May 2025) evaluating tertiary, skill-focused interventions for youth aged 10–24 met the eligibility criteria. Outcomes primarily indexed reductions in disruptive behavior (e.g., aggression, violent behavior) and/or improvements in skills (e.g., emotion regulation, self-control, empathy, problem solving). Theme-focused, multimodal, and sufficiently intensive programs were most consistently associated with reduced aggression and improved skills. However, findings and methodological quality were heterogeneous, and follow-up data was limited. Digital delivery components were rare. We discuss these findings and propose a modular program architecture that combines a structured, evidence-based core (e.g., manualized content, fidelity monitoring) with planned flexibility (e.g., thematic breadth, dosage) to match youths' risk-need profiles and the constraints of justice, school, and community settings. Key limitations (e.g., limited follow-up, cultural sensitivity) and future directions (e.g., finer-grained analyses linking youngsters' needs to specific modules) are also discussed.

1. Introduction

Disruptive behavior in youth has long been a pressing concern for psychologists, educators, and policymakers (Ciocanel et al., 2017; Eme, 2020; Farrington, 2009: Lanctôt et al., 2007; Welsh et al., 2024). Importantly, disruptive behaviors carry implications beyond the immediate context. When persistent, they may consolidate deviant trajectories (e.g., school exclusion, peer rejection, and justice-system contact) that elevate risk for entrenched antisocial trajectories, rendering timely intervention especially critical (Bonta & Andrews, 2023). At the same time, adolescence and emerging adulthood are often considered optimal periods for intervention, during which well-designed interventions can be especially effective (Hodgkinson et al., 2021).

In this review, disruptive behavior is conceptualized as a heterogeneous set of behaviors that transgress normative social expectations (McCart et al., 2023), including both antisocial and delinquent behavior. On the one hand, antisocial behaviors encompass a wide range of actions that violate social norms, including deceit, aggression, as well as chronic rule-breaking that that may be harmful and socially disruptive even when not formally criminalized (Dobson & Talbot, 2017; Eisner & Malti, 2015; Morgado & Vale-Dias, 2013). Such behaviors are often revealing of deeper psychological dysfunctions and can have substantial social implications (Eme, 2020). Persistent patterns often co-occur with disorders like Conduct Disorder or Antisocial Personality Disorder, underscoring the need for early detection (American Psychiatric Association [APA], 2013; Eme, 2020). It is mainly a concept adopted in psychology and child/adolescent psychiatry (Farrington, 2009).

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Delinquency, on the other hand, is a socio-legal category that refers to juvenile offending as defined within a given sociolegal context and may trigger juvenile-justice intervention and sanctions (Farrington, 2012; Wilson, 2009). Depending on the jurisdiction, it can include both violations of criminal law and so-called *status offences* (i.e., forbidden behaviors because of the offender's age, such as truancy or alcohol abuse). Therefore, delinquency is primarily defined by legal and social criteria and does not necessarily map onto psychological or psychiatric classifications (Muncie, 2014). While delinquency and antisocial behavior differ in sociolegal consequences (e.g., usually antisocial behaviors do not lead to legal sanctions), they overlap substantially as antisocial youths frequently engage in delinquent acts, and vice-versa (Farrington, 2005; Staff et al., 2015). Even when the overlap is incomplete, societal and service responses often converge on a shared objective: reducing maladjustment and harm by strengthening malleable personal and social competencies that support prosocial functioning (Arce et al., 2011; Maag, 2006; van Stam et al., 2014).

Overall, personal and social skills can be defined as a set of modifiable abilities, dispositions, and enacted behaviors that shape how young people navigate interpersonal demands and regulate emotions and conduct (e.g., communication, emotion regulation, perspective taking, conflict resolution, social problem solving, and moral reasoning) (Maag, 2006; Owens & Johnston-Rodriguez, 2010; Weis & Conzelmann, 2015). This skills-focused lens is consistent with contemporary treatment evidence (cf. McCart et al., 2023) for adolescent disruptive behavior, which increasingly emphasizes multi-component and mechanism-oriented approaches rather than diffuse, non-specific service provision.

In this sense, being socially competent implies that youths can adapt to varying social contexts, establish functional relationships, and comply with normative expectations while maintaining self-directed goals (Maag, 2006; Rose-Krasnor, 1997). This conceptualization is particularly relevant in tertiary service contexts, where disruptive behavior is seldom driven by a single factor and where intervention decisions must prioritize targets that are both malleable and plausibly causally proximal to aggression, rule-breaking, and reoffending (Bonta & Andrews, 2023; Mulvey et al., 2016).

Against this backdrop, it is important to note that both rehabilitative frameworks (e.g., Mathys, 2017) and strengths or positive-based models (e.g., Butts et al., 2010; Ciocanel et al., 2017; Majed et al., 2021) have increasingly informed programs that explicitly develop personal and social skills (Koehler et al., 2013; Majed et al., 2021; Mathys, 2017). This convergence matters here for two reasons. First, it clarifies the theoretical logic underlying the programs synthesized in this review: across disruptive and justice-involved populations, deficits in self-regulation, social-information processing, and interpersonal problem solving are plausible mechanisms explaining the maintenance of disruptive behavior (Cunha et al., 2025). Second, skills are measurable, trainable, and frequently embedded as explicit program components that can be compared across implementation ecologies (Kautz et al., 2014). Notwithstanding, while this review adopts the inclusive construction of personal and social skills, nomenclatures eventually also vary across intervention programs, as models frequently deploy idiosyncratic labels (e.g., emotional, cognitive skills) and taxonomies that reflect the more concrete theoretical approaches and pragmatic emphases (cf. Maag, 2006).

In the face of the above, the present review concentrates on tertiary-level interventions, namely programs delivered to young people who have already manifested disruptive conduct and/or have entered youth justice pathways, with the express aim of fostering desistance or curbing further escalation (Greenberg & Abenavoli, 2017; Higginson et al., 2015). The added value of this focus is that tertiary services operate under distinct constraints and decision-making challenges compared with primary or secondary prevention: risk profiles are higher, needs are more complex, and outcomes are typically framed in terms of harm reduction, persistence, and reoffending (Cunha et al., 2025). While primary and secondary preventive interventions remain crucial, they constitute a very large and methodologically distinct evidence base (cf. Axford et al., 2022). A tertiary focus therefore allows the review to synthesize what is most actionable for services working with youngsters who are already presenting disruptive behavior, where the central question is not whether disruptive conduct can be prevented in the population, but how escalation and recurrence of social harm can be reduced once a disruptive trajectory is established (cf. Welsh et al., 2024). Custodial and non-custodial measures, in themselves, do not necessarily prevent recidivism; rather, prevention depends on the type and quality of the programs and interventions provided (Creemers et al., 2023). Accordingly, attention should shift to the specific interventions that drive meaningful change.

Meta-analytic findings showed that tertiary-level programs on personal and social skills seem to be a relevant mechanism to decrease antisocial tendencies or different types of violent behaviors (cf. Beelmann & Lösel, 2021; Maag, 2006; Moreno & Jurado, 2024; van der Stouwe et al., 2021). Indeed, some interventions have been found to reduce youth reoffending by approximately seven percentage points, with recidivism operationalized either through official justice indicators (e.g., rearrest, reincarceration) or through self-reported offending outcomes (Koehler et al., 2013). Other studies have reported even larger effects, indicating 25–50% relative reductions in reoffending or recidivism risk compared with control conditions (Landenberger & Lipsey, 2005).

Consensus therefore points to the value of skills-focused tertiary programs, often tailored to each young person's developmental capacity, risk profile, and ecological context (Bonta & Andrews, 2023; Hollin & Palmer, 2009; Koehler et al., 2013). However, the field still lacks systematic identification and quality evaluation of the most up-to-date, empirically supported studies that appraise programs' effectiveness. Doing so is essential for steering practice between the twin pitfalls of nothing works skepticism and anything works eclecticism, thereby ensuring that disruptive youth receive services of demonstrable quality (Goense et al., 2016; Hollin & Palmer, 2009; Koehler et al., 2013).

2. Present study

Systematic reviews relevant to disruptive behavior and delinquency have generated valuable evidence, but several features limit their value for tertiary skills-focused programs. Systematic reviews have predominantly examined universal programs delivered in schools or community settings, typically assessing a single program such as Second Step (e.g., Moy & Hazen, 2018) or juxtaposing several "after-school" approaches (e.g., Kremer et al., 2014; Zief et al., 2006). These contributions have been instrumental for understanding population-level prevention, yet they are less informative for post-onset service delivery for youths with established disruptive patterns.

Within youth justice, reviews have more often centered on standard judicially mandated interventions (e.g., case management and generic therapy) (cf. Evans-Chase & Zhou, 2013). When skill-focused tertiary programs have been studied, the focus tended to narrow to a single model, such as the well-known Aggression Replacement Training (ART) (e.g., Brännström et al., 2016; Ensafdaran et al., 2019), or to thematically delimited initiatives targeting one domain (e.g., Heynen et al., 2023) or one broader construct (e.g., resilience, Hodgkinson et al., 2021). In parallel, other syntheses have restricted attention to specific modalities (cf. Jugl et al., 2023) or arts-based interventions (cf. Mansfield et al., 2023).

Other important contributions, more closely aligned with the present proposal, have restricted their analysis to studies employing only control-group designs (e.g., Hodgkinson et al., 2021; Koehler et al., 2013). While methodologically rigorous, this approach can underrepresent the evidence base for tertiary prevention in real-world youth justice settings, where robust controls or random allocation are frequently constrained by legal, ethical, and operational difficulties to perform trials (Axford et al., 2022), more specifically to implement

randomized ones (Asscher et al., 2007). Other reviews have further limited their scope geographically, concentrating solely on the United States (Evans-Chase & Zhou, 2013) or Europe (Koehler et al., 2013).

In this review, it is our aim to include diversified tertiary prevention programs, understood as interventions targeting young people with established disruptive behavior patterns who are already involved in youth justice or child protection services. Consistent with public-health usage, tertiary prevention is understood as action taken after onset and consolidation of a problem pattern, aimed at reducing severity, persistence, and downstream harms (O'Connell et al., 2009).

The added value of the specific review design is fourfold. First, it directly addresses the fragmentation of prior syntheses by systematizing the broad range of skill-focused tertiary programs, rather than a single branded model, a single theme, or a single modality, thereby producing an integrative map of what has been developed and evaluated internationally. Second, it deliberately broadens the service ecology under consideration: while acknowledging that many tertiary programs are embedded in justice settings, it also captures effective skill-focused interventions implemented in other high-relevance contexts for tertiary intervention (e.g., schools, and community venues), consistent with recent work on adolescents presenting externalizing and internalizing symptomatology (cf. Kvamme et al., 2024). Third, instead of excluding non-controlled studies outright, the review adopts an inclusive design strategy while explicitly appraising methodological quality, without sacrificing critical judgment about different studies in the field. Fourth, in a moment of strong digital technological development in criminal justice (Cowell et al., 2018), the review extends prior work by also examining contemporary digital delivery realities (cf. for programs targeting individuals with a history of offending behavior, not just youngsters, see Calaboiça et al., 2023), namely whether and how recent tertiary interventions directed at youngsters with digital components (e.g., mobile apps, online modules, virtual reality components) are being evaluated.

3. Method

To present the most important information about the current study, the 2020 guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (cf. Page et al., 2021) have been used, incorporating the latest advancements in study identification, selection, evaluation, and synthesis within this model.

3.1. Eligibility criteria

Inclusion criteria for study eligibility were divided into study-specific characteristics (addressed in each database) and participant-specific criteria (addressed during screening). Study-specific criteria included: (1) peer-reviewed studies; (2) studies published in English, Portuguese, and Spanish were included, reflecting the research team's language proficiency and enabling a balance between international dissemination and contextual relevance to youth justice and child protection settings, especially in Southern Europe and Latin America; and (3) studies published from 2013 onwards, to capture contemporary intervention models aligned with recent theoretical, policy, and service delivery developments. The review was intentionally focused on psychosocial and service-based interventions within psychology, social work, and youth services, consistent with the scope of the present review, excluding predominantly medical or pharmacological approaches.

The 2013–2025 time window was chosen to avoid duplicating earlier comprehensive systematic reviews and meta-analyses covering pre-2013 intervention evidence for disruptive and antisocial behavior (e.g., Koehler et al., 2013; Landenberger & Lipsey, 2005; Lipsey, 2009; Pearson et al., 2002) while capturing the most recent generation of tertiary skills-focused programming and evaluation practices. Since 2013, recent syntheses have been published but, to our knowledge, highlight both advances and persistent gaps. McCart et al. (2023) extended coverage in treatment-level reviews to 2021 but did not focus on social and personal skills programs. Similarly, Castillo Eito et al. (2020) synthesized studies up to December 2018, but their inclusion of universal, selective, and tertiary interventions makes it difficult to isolate effects specific to youth with a history of disruptive behaviors. By setting up our search window from 2013 to the present, we aim both to prevent redundancy with earlier syntheses and to capture the most recent generation of tertiary personal and social-skills programs, aligned with current service realities.

Participant-specific criteria included: (1) individuals aged 10–24 years, a deliberately broad span that reflects the heterogeneous socio-legal definitions of youth across jurisdictions (cf. Abrams et al., 2018) and permits to bring together interventions implemented in countries where the juvenile age boundaries differ; (2) participants have history of disruptive behaviors; (3) have participated in skill-oriented program; and (4) programs developed at tertiary level. Noteworthy, the selected age range is consistent with international usage of "young people" according to World Health Organization (2011).

Case studies, theses (master's and doctoral), previous meta-analyses, and literature reviews were excluded, as well as studies outside the fields of psychology, criminology, social sciences, and computer science. Doctoral theses were excluded to prioritize peer-reviewed empirical evidence with more standardized reporting and indexing. Exclusion criteria related to the type of intervention were as follows: (1) one-time interventions (e.g., one single workshop), (2) unstructured activities (e.g., socializing with peers, recreation centers), and (3) interventions consisting solely of judicial measures (i.e., individual case-management, mandatory attendances).

3.2. Search strategy and information sources

The primary search strategy was based on a review protocol organized around five sets of keywords: promotion, prosocial behaviors, youth, intervention, and antisocial behavior. To ensure a comprehensive retrieval of the literature, these themes were combined into a Boolean research equation. This equation utilized truncation (indicated by asterisks) and wildcards (indicated by question marks) to account for pluralities and international spelling variations (e.g., *behavio?r* to capture both American and British spellings). The search targeted indexed terms in the Title, Abstract, and Keywords (also known as topic) using the following string: (promotion OR training program* OR traineeship OR delinquency prevention OR program* OR violence prevention OR crime prevention) AND (prosocial behavio?r* OR prosocial competences OR social competences OR moral courage OR emotional regulation OR anger management) AND (young* OR adolescent* OR teenager* OR youth OR juvenile* OR delinquent* OR perpetrator*) AND (intervention OR program* evaluation OR evaluation OR juvenile justice OR digital) AND (antisocial behavio?r* OR delinquency OR violence OR aggression* OR crime* OR perpetration). A secondary, hands-on search was then conducted, including an examination of gray literature and backward and forward citation tracking of articles identified in the primary search.

The databases consulted include Web of Science, Scopus, B-On, ProQuest and PubMed. Moreover, individual searches in journals such as Youth Justice, Youth Violence, and Crime and Delinquency from SAGE, as well as those from Taylor & Francis, were performed, to look for further studies that might not have been recovered from the database searches. All database and supplementary searches were conducted between 15 and 19 May 2025. We considered studies published from January 2013 through May 2025.

3.3. Data collection

Two reviewers worked on titles and abstracts screening. Subsequently, the required information (e.g., study characteristics, participant details, intervention descriptions, outcomes, and results) was

extracted using Rayyan (Ouzzani et al., 2016) to manage the references. Any uncertainty or disagreement was resolved through consensus in team meetings. If a decision could not be reached, a third and fourth reviewer (i.e., the fourth and fifth authors) were consulted. All extracted data were compiled in a secure, shared database, with version control enabled to maintain an audit trail of any changes. This approach ensured reproducibility and transparency across all stages of the data collection process. Fig. 1 illustrates the overall data collection and study selection, following the PRISMA 2020 guidelines.

3.4. Data items

We collected two primary outcomes: (1) reduction of disruptive behavior (e.g., official data on recidivism, self-reported indicators of aggression reduction), and (2) increase of skills (i.e., self-reported measures of different dimensions). Since this paper aims to analyze several types of programs, it is important to emphasize that the outcomes varied significantly in terms of assessment methods (e.g., official records, self-reported measures), theoretical models, and evaluation protocols used in each program. This diversity is the main reason why a meta-analysis was not conducted.

Additional data items were also collected, such as the program's theme, modality, modules, number of sessions, research design, degree of digitalization, sample size and features, participants' sex and age, and main results, among other elements (e.g., limitations of the study, existence of a follow-up). Where information was missing or unclear, it was documented as "not reported."

Furthermore, we found multiple documents reporting data on the evaluation of the same program, conducted in the same country and usually with identical participant cohorts, even when different research designs and protocols were used. These documents were aggregated under the same program. If there were varying or inconsistent findings, the specific study is distinguished in the 'Main Findings' section.

3.5. Quality assessment

The Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018) was chosen to evaluate the methodological quality of the diverse evidence base included in our review, which comprised qualitative studies, randomized controlled trials (RCTs), non-randomized quantitative studies, quantitative descriptive studies, and mixed methods designs.[1] This appraisal took place in three sequential stages. First, two screening questions determine whether a paper reports empirical research. A negative or indeterminate answer halts further evaluation. Second, the study is classified into one of five design families – qualitative, quantitative-RCT, quantitative-non-randomized, quantitative-descriptive, or mixed methods. Finally, five binary criteria tailored to each design family address the major threats to validity and reliability, such as adequate randomization in RCTs or effective integration of qualitative and quantitative strands in mixed-methods studies. Each criterion is scored "Yes," "No," or "Can't tell," the last indicating insufficient or ambiguous reporting. To minimize subjectivity, the two reviewers independently appraised every study and resolved disagreements through discussion, with a third and fourth reviewer arbitrating any unresolved differences.

[1] In accordance to Hong et al. (2018, p. 7), a mixed method design have to meet the following criteria: "(a) at least one QUAL (Qualitative) method and one QUAN (Quantitative) method are combined; (b) each method is used rigorously in accordance to the generally accepted criteria in the area (or tradition) of research invoked; and (c) the combination of the methods is carried out at the minimum through a MM design (defined a priori, or emerging) and the integration of the QUAL and QUAN phases, results, and data".

4. Results

4.1. Study selection

Following Fig. 1, a total of 1033 articles were identified through the database search. An additional 34 reports were found through a secondary search and were also screened for eligibility. First, duplicate records were removed. Then, the titles and abstracts of all retrieved papers were assessed based on the predefined eligibility criteria.

After 281 duplicates were removed, the titles and abstracts of 706 studies were screened. At this stage, studies were excluded for lacking structural interventions; involving participants under 10 or over 24; not assessing intervention efficacy; not being tertiary programs; or not focusing on disruptive behaviors (antisocial behavior and delinquency). Of these records, 37 studies were retrieved for full-text review, as well as an additional 34, which were located through manual searching and backward and forward-citation tracking. This brings the total to 70. A total of 27 full-text papers were excluded for reasons such as ineligible participant age range, study protocols lacking outcome data, selective prevention focus, absence of any effectiveness or efficacy evaluation, among others. Ultimately, 43 studies published between 2013 and 2025 were included in the final review. Relevant information was extracted in accordance with the data items defined for the purposes of the study (see also, Fig. 1).

4.2. Study characteristics

All included studies are detailed in Table 1. Regarding the 43 studies, 14 met most MMAT criteria (meaning that few or no concerns about potential sources of bias were identified), 21 met some criteria but had several unclear or negative ratings (indicating some concerns), and eight showed substantial methodological limitations. Moreover, a near-perfect fidelity rate ($\kappa = 0.93$) was calculated using Vala's (1986) formula, indicating a high level of agreement between the two independent coders in their classification of the data (Guest et al., 2006; Martins & Machado, 2006).

Most of the studies were conducted in the Netherlands (20.93%; $n = 9$), USA (16.28%; $n = 7$), and Portugal (11.63%; $n = 5$). The studies employed a variety of research designs, including non-randomized controlled trials (NRCT; 48.84%; $n = 21$), single group repeated measures (SGRM; 20.93%; $n = 9$), randomized controlled trials (RCT; 20.93%; $n = 9$), and case study designs (CSD; 2.33%; $n = 1$). Three studies used mixed methods designs (6.98%; n = 3): Dellar (2024) combined a paired-group pre-post analysis with participant feedback; Suh (2023) combined self-reported aggression measures with semi-structured interviews; and Fernández et al. (2014) combined self-report measures with observational records, focus groups, questionnaires, and field notes. Further details of the studies are provided in Table 1.

A total of 28 studies (65.12%) assessed both disruptive and prosocial outcomes, while 15 studies (34.88%) evaluated one of these outcomes. In contrast, 15 studies (34.88%) evaluated only one of these outcome domains. When assessing disruptive outcomes, studies primarily evaluated reductions in self-reported aggression, as well as antisocial/externalizing behavior and anger/hostility; some also relied on staff risk-assessment records and official indicators such as reoffending. For prosocial outcomes, most studies focused on self-reported gains in emotion regulation, impulse control, conflict resolution, empathy/compassion, communication, and moral reasoning.

Most studies relied on self-reported measures, with 20 studies (46.51%) assessing reductions in disruptive behaviors and 34 studies (79.07%) measuring enhancements in personal and social skills. Two studies (cf. Helmond et al., 2015; van der Stouwe et al., 2019) exclusively used official records to evaluate reductions in disruptive behaviors (4.88%), while four studies (9.30%) relied solely on staff reports (cf. Rijo et al., 2020; Schippers et al., 2020; van der Stouwe et al., 2019;

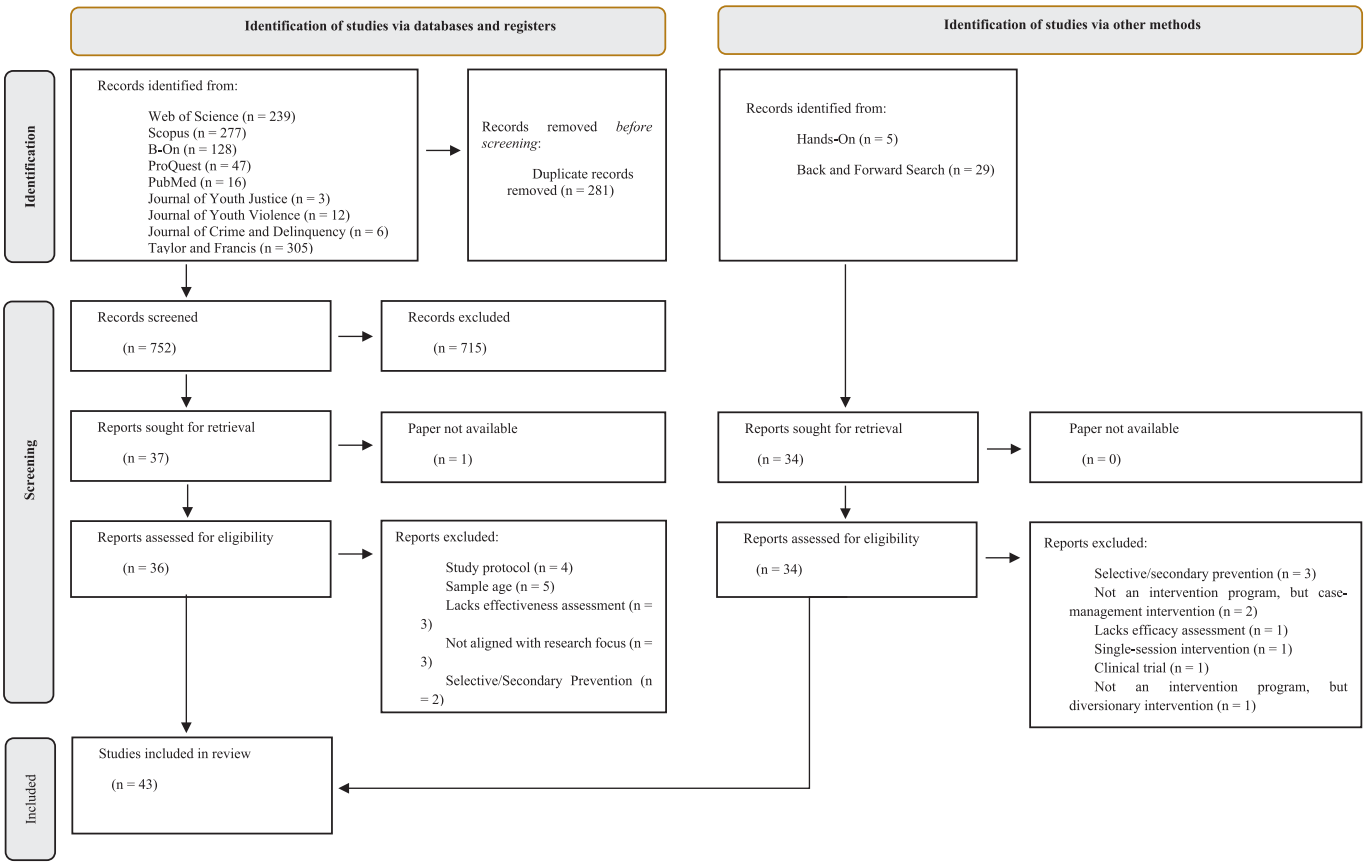


Fig. 1. PRISMA Flow Diagram: Flow of information on data collection and study selection's process during this systematic review.

Yalçın et al., 2023). The remaining ten studies (23.26%) combined multiple data sources. Some integrated staff reports and official records (cf. Hoogsteder et al., 2018), others used staff and self-reports (cf. Hoogsteder et al., 2014, 2016, 2021; Ribeiro da Silva et al., 2021; Rijo et al., 2023), and some combined self-reports and official data (cf. Dellar, 2024; Hein et al., 2020). One study (cf. Derbyshire et al., 2019) incorporated all three sources (i.e., self-reports, staff reports, and official records) for evaluation. Only one study (2.33%; Sousa et al., 2023) used multiple measures to assess both outcomes. It was also the only study (cf. Sousa et al., 2023) to incorporate physiological measures (i.e., ECG signals).

The number of participants ranged from nine (Fernández et al., 2014) to 364 (Williams et al., 2021), with a mean sample size of 101.73. Participants were predominantly male (55.81%; $n = 24$), with 14 studies including both genders (32.56%), two focusing exclusively on female youth (4.65%), and three not specifying the sample gender (6.98%). The overall mean age was 14.54 years old ($SD = 2.05$; range from 12 to 24 years). Regarding the sampling frame, most of the studies were from the justice system (69.77%, $n = 30$), while a single study had a community sample (2.33%). Of the remaining 12 studies (27.91%), seven were school samples and five multi-samples (including mental health and community).

4.3. Main findings

4.3.1. Programs' main characteristics

The interventions evaluated across the included studies exhibited substantial heterogeneity (Table 2). The programs examined most frequently were PSYCHOPATHY.COMP (Portugal; Ribeiro da Silva et al., 2021; Rijo et al., 2023; Sousa et al., 2023), Re-ART (Netherlands and Turkey; Hoogsteder et al., 2014, 2018; Kaya & Buzlu, 2016) and Re-ART Outpatient (Netherlands; Hoogsteder et al., 2016, 2021, 2023), each assessed in three studies. A further group of interventions – GPS-25 (Portugal; Rijo et al., 2013, 2020), the *Programa de Pensamiento Prosocial* (Spain and Mexico; Fernández et al., 2014; Contreras & Armenta, 2015), Tools4U (Netherlands; van der Stouwe et al., 2016, 2019) and Williams LifeSkills Training (China; Chen et al., 2014; Zhang et al., 2015) – was analyzed in two studies each. Seven studies did not specify the program.

Three incorporate digital components, such as E-Prime® 2.0 (cf. Ren et al., 2021), telehealth programs (cf. Braeuer et al., 2022), and applications/games in smart devices (cf. Jones et al., 2024). The results indicated that few studies conducted follow-up assessments (n = 10; 24.39%) of which only two studies have more than one year follow-up (Hoogsteder et al., 2018; van der Stouwe et al., 2019). Of the remaining studies, three have multiple follow-up periods for one year (Fung et al., 2013; Walker et al., 2019; Wong et al., 2018), and five studies had a single follow-up period (Dellar, 2024; Rijo et al., 2023; Song & Kim, 2022; Sousa et al., 2023; Zhang et al., 2015).

Almost half of the programs were thematic (i.e., single-theme program which entire content and activities revolve around one clearly delimited theme, objective, or risk factor, like cognitive restructuring or emotional regulation) (51.16%; $n = 22$), while the other half was multi-thematic (41.86%; $n = 18$), and a small number were unspecified (6.98%; $n = 3$). Both thematic (34.88%; $n = 15$) and multi-thematic (27.91%; $n = 12$) programs were commonly used in justice settings. In school settings, thematic interventions were the most frequent (n = 6) and varied widely, including emotional regulation (Fung et al., 2013), meditation to enhance self-control (Franco et al., 2016), music therapy to support emotional expression (Suh, 2023), and peace psychology approaches (Esmaeili et al., 2020). Only one school-based program had a multi-thematic focus (cf. Williamson et al., 2013). All five programs implemented (cf. Hoogsteder et al., 2016, 2021, 2023; Schippers et al., 2020; Song & Kim, 2022) across multiple contexts were multi-thematic. The community-based program (Srinivasan et al., 2023) was thematic,

Table 1
Description of the studies included and MMAT evaluation.

Authors/year	Country	Research Design	Sample size (*n*)	Setting	Participants' description	MMAT Rating
Akbas & Yigitoglu, 2022	Turkey	RCT	48 (24 EG; 24 CG)	School system	36 male and 12 female	3
Avcioglu & Gokalp, 2023	Turkey	NRCT	84	School system	19 male and 56 female	3
Braeuer et al., 2022	USA	SGRM	88	Justice system	67 males and 24 females	3
Chen et al., 2014	China	RCT	66 (33 EG,33 CG)	Justice system	66 males	3
Contreras & Armenta, 2015	México	SGRM	159	Justice system	156 males and 3 females	3
Dellar, 2024	Australia	SGRM + CSD	110	Justice System	145 males	3
Derbyshire et al., 2019	England	SGRM	21	Justice system	21 males	2
Esmaeili et al., 2020	Iran	NRCT	26 (13 EG, 13 CG)	School system	26 males	2
Fernández et al., 2014	Spain	CSD	9	Justice system	9 males and 1 female	2
Franco et al., 2016	Spain	NRCT	27 (13 EG)	School system	16 males and 11 females	4
Fung et al., 2013	China	SGRM	63	School system	38 males and 25 females	3
Goldstein et al., 2018	USA	RCT	Pre-test:70, Post-test: 57	Justice system	70 females	3
Hein et al., 2020	USA	Study 1: RCT	289 (118 EG, 171 CG)	Justice system	289 males	2
		Study 2: SGRM	187	Justice system	159 males and 28 females	3
Helmond et al., 2015	Netherlands	NRCT	133 (110 EG,	Justice system	98 males	4
Hoogsteder et al., 2014	Netherlands	NRCT	91 (63 EG, 28 CG)	Justice system	79 males	3
Hoogsteder et al., 2016	Netherlands	NRCT	26 (13 EG, 13 CG)	Multiple	22 males	4
Hoogsteder et al., 2018	Netherlands	NRCT	91 (63 experimental, 28 control)	Justice system	59 males	4
Hoogsteder et al., 2021	Netherlands	NRCT	76 (47 experimental, 29 in control)	Multiple	61 males	3
Hoogsteder et al., 2023	Netherlands	NRCT	93 (45 EG; 48 CG)	Multiple	77 males	3
Jones et al., 2024	Australia	SGRM	Pre-test: 22, Post-test:12	Justice system	22 males	3
Kaya & Buzlu, 2016	Turkey	NRCT	65 (32 EG, 33 CG)	Justice system	Recruited in 2012/13	2
Kendall et al., 2017	USA	RCT	310	Justice system	46 males	3
Kızıltepe, et al., 2023	Turkey	RCT	38 (19 intervention, 19 CG)	Justice system	38 males	2
Li et al., 2023	China	RCT	73 (36 EG, 37 CG)	Justice system	73 males	0
Ren et al., 2021	China	RCT	56 (28 EG; 28 CG)	Justice system	56 males	2
Ribeiro da Silva et al., 2021	Portugal	NRCT	119 (58 EG, 61 CG)	Justice system	119 males	5
Rijo et al., 2013	Portugal	SGRM	55	Justice system	55 males	3
Rijo et al., 2020	Portugal	NRCT	123 (63 EG,	Justice system	123 males	5
Rijo et al., 2023	Portugal	NRCT	119 (58 EG, 61 CG)	Justice system	119 males	5
Schippers et al., 2020	Netherlands	RCT	25	Multiple	17 males	2
Song & Kim, 2022	South Korea	NRCT	71 (35 EG, 36 CG)	Multiple	65 males and 6 females	5
Sousa et al., 2023	Portugal	NRCT	109 (56 EG, 53 CG)	Justice system	109 males	5
Srinivasan et al., 2023	India	NRCT	32 (16 EG,	Community	32 males	3
Suh, 2023	South Korea	NRCT + CSD	73 (38 EG,	School system	73 males	4
van der Stouwe et al., 2016	Netherlands	NRCT	354 (115 EG, 108 CG)	Justice system	159 males and 64 females	3
van der Stouwe et al., 2019	Netherlands	NRCT	223 (115 EG, 108 CG)	Justice system	159 males and 64 females	3
Walker et al., 2019	USA	NRCT	87 (57 EG, 30 CG)	Justice system	87 females	3
Williams et al., 2021	USA	SGRM	Pre-test: 364, Post-test: 288	Justice system	199 males and 89 females	4
Williamson et al., 2013	USA	SGRM	31	School system	29 males and 2 females	4
Wong et al., 2018	China	NRCT	40 (20 EG, 20 CG)	Justice system	36 males and 4 females	4
Yalçın et al., 2023	Turkey	NRCT	35 (20 EG, 15 CG)	Justice system	Age range: 14 – 18	3
Zhang et al., 2015	China	RCT	65 (33 EG, 33 CG)	Justice system	65 males	3
Zhou et al., 2018	Singapore	SGRM	156	Justice system	153 males	4

Footnote: CSD = Case Study Design, SGRM = Single Group Repeated Measures, RCT = Randomized Controlled Trial, NRCT = Non-randomized controlled trial, EG = Experimental Group, CG = Control Group, CBT = Cognitive Behavioral Therapy, MBCT = Mindfulness-Based Cognitive Therapy, TAU = Treatment as Usual.

focused on anger management.

In terms of the type of program, most programs were unimodal (53.49%; $n = 23$), a slightly fewer number were multimodal (39.53%; $n = 17$), and a small number were categorized as unknown (6.98%; $n = 3$). Multimodal programs tended to address broader risk factors simultaneously by combining multiple therapeutic techniques or intervention strategies. The most common approach to intervention across studies was CBT (55.81%; $n = 24$). Many programs were entirely CBT-based or incorporated CBT principles.

Interventions were delivered in multiple formats (see table 2). Group-based interventions were the most common (55.81%; $n = 24$), followed by individual-based programs (27.91%: $n = 12$), and mixed-modality programs combining both formats (11.63%; $n = 5$). Two studies did not specify the intervention format (4.65%). Lastly, the number of sessions per program ranged from four (e.g., Ren et al., 2021) to 40 (e.g., Rijo et al., 2013), but delivery schedules differed substantially. When reported, programs with fewer sessions were often delivered in high-intensity formats, such as two sessions per day over five consecutive days in SECE (Song & Kim, 2022) or eight sessions in eight days (Li et al., 2023). Others, even if not performed consecutively in days, were concentrated within a short timeframe, typically no more than four weeks, as in the AMT program (Srinivasan et al., 2023) and the CBM-I (Ren et al., 2021). Many interventions were delivered over 6–10 weeks, for example 8–20 sessions delivered once weekly in Williams LifeSkills Training (Chen et al., 2014; Zhang et al., 2015), twice weekly in the School-Link Advantage (Jones et al., 2024), or three times per week in Positive Life Changes (Williamson et al., 2013). Finally, some programs extended over several months, with weekly sessions delivered across 4–12 months, as reported for PSYCHOPATHY.COMP (Rijo et al., 2023), GPS-25 (Rijo et al., 2013), LMV-E (Derbyshire et al., 2019), and RE-ART (Hoogsteder et al., 2018; Kaya & Buzlu, 2016), and in some cases up to 18 months (RE-ART outpatient; Hoogsteder et al., 2021, 2023). Overall, session duration, when specified, typically ranged from approximately 45–120 min.

4.3.2. *Effectiveness*

The effectiveness of interventions varied depending on the previously described characteristics. Regarding digital components, only one study formally assessed their impact on behavioral outcomes. Specifically, Braeuer et al. (2022) evaluated a fully online, asynchronous anger-management psychoeducation programme delivered via the Seesaw app. The programme comprised four modules, each to be completed within a week, with at least one interactive activity. The study reported improvements in anger outcomes.

Table 2
Programmes' description.

Program's name	Thematic	Model	Modules	Sessions	Outcomes	Main results	Digital's impact
AMT	Thematic	Unimodal (*SLT*)	Assertiveness training	8 sessions	I, II	Improvement in self-esteem; violence decreases	N/A
CBM-I	Thematic	Multimodal (*SIP, ICM*)	N/A	1 per week	I, II	Improvements positive interpretation bias and reduced self-reported physical aggression	N/A
Emotional Management	Thematic	Unimodal (*CBI*)	N/A	10 sessions	I, II	The program was similar or less effective than TAU. (study 1)	N/A
EQUIP	Multi-thematic	Multimodal (*CBT, PPC*)	N/A	30 sessions:	I	No decrease in the recidivism levels	N/A
Fluir meditación	Thematic	Unimodal (*Mindfulness training*)	Mindfulness training	10 sessions:	I, II	Reductions in cognitive, motor and non-planned impulsivity, and verbal and physical aggression.	N/A
GOAL	Multi-thematic	Multimodal (*CBI, SEP*)	N/A	20 sessions	I, II	Reduced risk behaviors at the 6-month follow-up.	N/A
GPS-25	Thematic	Unimodal (*CBT*)	Human communication,	40 sessions	I, II	60% improvements after the intervention, with 50.9% and 52.7% improvements in externalizing and internalizing problems	N/A
JJAM	Thematic	Unimodal (*SIP*)	Emotion regulation	16 sessions	I	Post-test levels of anger, physical aggression, and relational aggression were lower compared to delinquent girls in the TAU condition.	N/A
LMV-E	Thematic	Multimodal (*GAM, RNR, The Good Lives Model, CBM, Positive psychology*)	N/A	300 h for 9 months	I, II	Improvements in self-reported aggression, decreased emotional reactivity, enhanced emotional control, and increased optimism	N/A
LST	Multi-thematic	Unimodal (*positive youth justice*)	Strengths and goal setting,	5 sessions	II	Improvements in knowledge, attitudes, and skills, including goal setting, stress management, and communication	N/A
No name	Thematic	Unimodal (*CBI*)	Emotional literacy and awareness, regulating emotions	10 sessions	I, II	Improvements in emotional regulation	N/A
No name	Multi-thematic	Unimodal (*CBI*)	Emotions	16 sessions	NA	Improved communication and empathy skills.	N/A
No name	Thematic	Unimodal (*SIP*)	Emotions	8 sessions	I, II	Effective in reducing the hostile interpretive bias associated with ambiguous angry faces	N/A
No name	Thematic	Unimodal (*SEL*)	N/A	4 sessions	I, II	Help reduce anger	N/A
No name	Thematic	Unimodal (*CBT*)	N/A	8 sessions	I, II	Enhancing anger control and reducing both trait anger and anger-out levels	N/A
No name	Thematic	N/A	N/A	4 weeks at maximum	I	Reduction of anger.	Good results in reducing the anger
No name	Thematic	Unimodal (*peace psychology)*	Interpersonal peace,	8 sessions	II	Higher psychological and emotional well-being	N/A
No name	Multi-thematic	Unimodal (*CBT*)	Emotion management training,	16 sessions	I, II	Delinquency and impulsivity decreased at 6-month and 12-month follow-up.	N/A
PHAT Life	Multi-thematic:	Unimodal (*Jessor's Problem Behavior Theory*)	N/A	8 sessions	I	Reduction in aggression mainly in the first 6 months	N/A
Positive Life Changes	Multi-thematic	Multimodal (*SIP, CBI*)	3 workbook lessons	15 sessions:	I, II	Improvements in decision-making, sense of self, and moral beliefs, along with reductions in their tendency toward physical and verbal aggression.	N/A
PPS	Thematic	Unimodal (*normal version: CBI;* short version: *Meirieu's French pedagogy*)	Recognizing and managing emotions	13 sessions	I, II	Reduce in issues related to attention, impulsivity-hyperactivity, learning, aggression, family problems, and attention disorders, impulsivity and hyperactivity, conduct disorders, and oppositional defiant disorder	N/A
Project Care	Thematic	Multimodal (*SIP, CBI*)	N/A	10 sessions	I, II	Decrease in proactive, reactive, and physical aggression at 1 year follow-up	N/A

(*continued on next page*)

Table 2 (*continued*)

Program's name	Thematic	Model	Modules	Sessions	Outcomes	Main results	Digital's impact
PSYCHOPATHY. COMP	Thematic	Multimodal (*CFT + motivational interviewing strategies*)	The basics of our mind	20 sessions	I, II	Decrease in shame and fears of compassion, increase in social safeness, self-compassion, and compassion for others	N/A
RE-ART	Multi-thematic	Multi-Modal (*CBT, SIP, GAM, RNR, systemic intervention with family*)	Intake and Motivating, Aggression Chain, Controlling Skills, Influence of Thinking, and the Group Module.	Individual	I, II	Reduction of 37.7% in 2 and 29.8% in 3 years of recidivism rates compared to TAU	N/A
RE-ART – Outpatient	Multi-thematic:	Multi-Modal (*CBT, SIP, GAM, RNR, Systemic intervention*)	Intake and Motivation, Aggression Chain; Self/ anger control, Influence of Thinking, and Assertive Behavior, Family/ system	12 to 14 sessions	I, II	Reduction in aggressive behavior.	N/A
Re-ART Compact	Multi-thematic	Multi-Modal (*CBT, SIP, GAM, RNR, systemic intervention*)	Start module, Controlling anger, Influence of Thinking, and Assertive Behavior.	4-month intervention	I, II	Improvements in executive function skills, particularly effective in enhancing inhibition, emotion regulation, and self-control.	N/A
School-Link Advantage	Multi-thematic	Multi-modal (*CRT; SCRT*)	N/A	20 sessions	II	Allied CRT and SCRT effectively address mental health disorders	N/A
SECE	Multi-thematic	N/A	Orientation	10 sessions	I, II	At 1-month follow-up, enhanced social and emotional competencies were observed.	N/A
SFA	Thematic	Unimodal	N/A	7 sessions	I, II	Reductions in anger	N/A
Tools4U	Multi-thematic	Unimodal (*CBI*)	N/A	8 to 12 sessions	I, II	39% of participants reoffended, with no differences compared to the TAU group across any recidivism outcomes. More effective for juveniles aged 16 to 18 years	N/A
VPP	Multi-Thematic:	Unimodal (*CBI*)	22 modules such as psychoeducation about violence, motivation to change	From 6 to 8 months (one session per week, two hours each)	I, II	Decreased tendencies to engage in aggressive behaviors, along with reductions in anger and improvements in anger regulation and self-control.	N/A
Williams LifeSkills Training	Thematic:	Unimodal (*CBT*)	Increasing awareness of and objectivity,	8 sessions	I, II	Reduces overt aggression, including verbal and physical aggression, self-directed aggression, impulsiveness, and hostility	N/A

Footnote: AMT: Aggression management training; CBI: Cognitive Behavioral intervention; CBM: Cognitive Behavioral model; CBT: Cognitive Behavioral theory; CFT: Compassion Focused Therapy; CMT: Compassionate Mind Training; CRM: Cognitive Remediation Therapy; EMS: Early Maladaptive Schemes; GAM: General Aggression Model; GOAL: Girls Only Active Learning; GPS: *Gerar Percursos Sociais*; ICM: Integrative Cognitive Model; JJAM: Juvenile Justice Anger Management; LMV-E: Life Minus Violence-Enhanced; LST: Life Skills Training; PPC: Positive Peer Culture; PPS: Programa de Pensamiento Prosocial; RNR: Risk-Need-Responsivity Model; SECE: Social and emotional competence enhancement; SEL: Social Emotional Learning; SEP: Social Empowerment Programs; SIP: Social Information Processing; SLT: Social Learning Theory; SCRT: Social-Cognitive Remediation Therapy; SFA: Solution-Focused Approach; TAU: Treatment as Usual; VPP: Violence Prevention Program. I – Reduction of disruptive behavior; II – Enhancement of skills.

In other words, in terms of theme, programs focusing on emotional identification and management were frequently linked to reductions in aggressive behavior and improvements in emotional regulation (Braeuer et al., 2022; Dellar, 2024; Fung et al., 2013; Goldstein et al., 2018; Yalçın et al., 2023). Equally, anger management programs demonstrated effectiveness in reducing impulsiveness and aggression (Srinivasan et al., 2023). Cognitive skills training also showed promising results, although its effectiveness varied across studies. Some reported improvements in aggression and cognitive distortions (Hoogsteder et al., 2014, 2016, 2018, 2023), while others found no effect on recidivism (Helmond et al., 2015). Other approaches focused on social skills, communication, and empathy training resulted in significant improvements in emotional regulation, decision-making, and interpersonal awareness (Kızıltepe et al., 2023; Song & Kim, 2022). Similarly, mindfulness and self-control interventions led to reductions in impulsivity and aggression (Franco et al., 2016; Zhang et al., 2015) and contributed to lower anxiety through improved emotional regulation.

Programs implemented in justice settings, such as Re-ART (Hoogsteder et al., 2018, 2023) and GPS-25 (Rijo et al., 2013, 2020), both focused on cognitive restructuring and impulse control, generated mixed results in terms of effectiveness. While GPS-25 led to emotional changes, it did not significantly impact schema endorsement. In contrast, Re-ART demonstrated a significant reduction in both violent behaviors and general recidivism, with a medium-to-large effect.

The only community-based intervention, AMT (Srinivasan et al., 2023), focused on anger management and social skills training, resulting in substantial reductions in aggression and impulsivity. School-based programs, such as Project Care (Fung et al., 2013), targeted emotion regulation and problem-solving, resulted in long-term reductions in both proactive and reactive aggression.

Multimodal programs such as the Re-ART and Re-ART Outpatient (Hoogsteder et al., 2014, 2018, 2021, 2023) combined Cognitive Behavioral therapy (CBT), Social Information Processing (SIP), General Aggression Model (GAM), and Risk-Need-Responsivity (RNR), leading to improvements in emotional regulation and reductions in recidivism. Similar to Life-minus violence-enhancement (LLV-E; Derbyshire et al., 2019), combining GAM, RNR, the Good Lives Model, CBM, and Positive Psychology, also leads to lower recidivism rates and makes youths more prone to prosocial actions.

In contrast, unimodal interventions often targeted specific

behavioral issues, for instance, the Violence Prevention Program (VPP) (Zhou et al., 2018), a CBT-based intervention, showed significant reductions in aggression, anger, and impulsiveness. However, unimodal programs often had limited effects on broader behavioral change. Likewise, Tools4U (van der Stouwe et al., 2016) showed small improvements in impulsivity and social perspective-taking but did not significantly affect recidivism rates in comparison with TAU group.

Also, specifically, CBT-based interventions were associated with reductions in aggression (Fung et al., 2013; Zhou et al., 2018), impulsiveness (van der Stouwe et al., 2016), and cognitive distortions (Hoogsteder et al., 2014, 2023), while also improving decision-making, emotional regulation, and prosocial behaviors (Zhang et al., 2015; Yalçın et al., 2023). CBT-based programs such as EQUIP, Tools4U, and VPP were frequently cited as promoting behavioral change. However, their effectiveness depended on the quality of implementation. For example, EQUIP (Helmond et al., 2015) failed to significantly reduce recidivism, but this was likely due to low program fidelity (35%–68%) rather than limitations in the CBT model itself.

Group interventions often showed strong results as they were particularly effective in enhancing emotional regulation, anger control, and impulsivity management, as well as promoting prosocial behaviors (e.g., Dellar, 2024; Franco et al., 2016; Kızıltepe et al., 2023; Srinivasan et al., 2023; Suh, 2023: Yalçın et al., 2023). However, individual interventions also had advantages, particularly in addressing cognitive distortions and improving emotional regulation (Ren et al., 2021). Regarding mixed-modality programs, some studies suggested that this combination could be particularly effective but needs to be carefully applied (Song & Kim, 2022). For instance, the EQUIP program (Helmond et al., 2015), which included both individual and group components, aimed to address cognitive distortions and promote social skill development. However, the program did not show a significant impact on recidivism, which was likely due to poor implementation rather than a problem with the mixed modality approach itself.

Short-term programs (less than 10 weeks) show immediate reductions in impulsiveness and aggression, but the lack of follow-ups does not provide information on their long-term sustainability (Franco et al., 2016; Ren et al., 2021). On the contrary, medium and long-term interventions (more than 10 weeks) seem to produce more stable and permanent behavioral improvements, reducing custody within six months post-intervention (Ribeiro da Silva et al., 2021) and lowering recidivism rates at two and three-year follow-ups (Derbyshire et al., 2019; Hoogsteder et al., 2018). These last had particularly good results in reducing impulsive thoughts and behaviors, cognitive distortions (Walker et al., 2019; van der Stouwe et al., 2016, 2019), aggressive attitudes and behaviors, and emotional control (Derbyshire et al., 2019).

4.3.3. *Implementation challenges*

High dropout rates (e.g., Braeuer et al., 2022; Fung et al., 2013; Hein et al., 2020; Kızıltepe et al., 2023; Yalçın et al., 2023), small sample sizes (e.g., Fernández et al., 2014; Franco et al., 2016; Helmond et al., 2015; Hoogsteder et al., 2018, 2023; Schippers et al., 2020; Walker et al., 2019; Williams et al., 2021), and lack of implementation control, and follow-up (e.g., Chen et al., 2014; Dellar, 2024; Jones et al., 2024; Rijo et al., 2020; Ribeiro da Silva et al., 2021; Zhou et al., 2018; Wong et al., 2018; Yalçın et al., 2023) limited fidelity in multiple studies. Moreover, lack of randomization led to potential selection biases, limiting generalizability (e.g., Esmaeili et al., 2020; Hoogsteder et al., 2018, 2023; Kaya & Buzlu, 2016; Rijo et al., 2023; Ribeiro da Silva et al., 2021; Song & Kim, 2022; Sousa et al., 2023; Suh, 2023; van der Stouwe et al., 2019; Yalçın et al., 2023; Zhang et al., 2015). Challenges such as participant engagement, facilitator adherence to protocols, and institutional constraints (e.g., financial limitations – Franco et al., 2016) influenced intervention success, with studies highlighting varying levels of adherence to manualized protocols (Sousa et al., 2023).

5. Discussion

This systematic review compiled tertiary prevention programs developed over the past 12 years to foster social and personal competencies in young people with a history of disruptive or delinquent behavior. In terms of *programs' main characteristics*, our corpus contained a near-equal number of thematic (n = 22) and multi-thematic (n = 18) programs. Multi-thematic programs tended to be more comprehensive, addressing broader risk factors simultaneously (e.g., Hoogsteder et al., 2016, 2018, 2023; Williams et al., 2021; Williamson et al., 2013; van der Stouwe et al., 2019), while thematic programs were often more focused on specific issues, such as emotional management or music expression (e.g., Contreras & Armenta, 2015; Srinivasan et al., 2023; Suh, 2023; Zhang et al., 2015). In general, our review suggests that programs addressing emotional regulation and anger management were the most common and consistently demonstrated effectiveness (e.g., Akbas & Yigitoglu, 2022; Avcioglu & Gokalp, 2023; Dellar, 2024; Li et al., 2023; Srinivasan et al., 2023).

Results indicated that single-themed interventions (i.e., those that concentrate intensively on a single domain such as anger management or emotional management) produce larger short-term gains in prosocial behavior and reductions in recidivism. These findings are in line with previous studies (cf. Franco et al., 2016; Williamson et al., 2013) that showed significant reductions in aggression and impulsivity, while also enhancing decision-making, self-control, and prosocial behaviors.

Nevertheless, these findings should not be interpreted as a categorical argument against multi-thematic interventions *per se*, but rather as a potential endorsement of more targeted and context-sensitive interventions. Youngsters with persistent disruptive behaviors typically display concurrent deficits in emotion regulation, cognitive distortions, and social-information-processing biases, so concentrating on a single theme may leave important needs unmet (Hipwell & Loeber, 2006; Mathys 2017). The risk-need-responsivity (RNR) model likewise emphasizes that programs must be matched to the specific criminogenic needs of each youngster (Bonta & Andrews, 2023; see also, Koehler et al., 2013).

Conventional multi-thematic interventions often aim to address a broad range of criminogenic needs within the narrow windows afforded by real-world budgets and schedules. The inevitable tradeoff, however, is the lack of depth: practitioners may briefly engage with numerous skill domains without delivering any with the intensity required to effect lasting change. A promising alternative is to adopt modular architecture – also in line with what has been called a granular approach (Axford et al., 2022) – in which practitioners construct a tailored sequence of evidence-based modules that target youngsters' most salient risk factors while maintaining the procedural fidelity of each module. Juvenile populations with disruptive behaviors are highly heterogeneous, and strict adherence to standardized, lengthy programs is not only impractical but may also be counterproductive (cf. Lipsey, 2018). Our aim is not to resolve the longstanding tension between program fidelity and adaptation (cf. Bopp et al., 2013), but rather to replace the binary "program-as-written versus local adaptation" debate with a disciplined, modular framework. Emerging evidence from other domains, such as youth therapeutic interventions, suggests that such an approach can enhance clinical flexibility while preserving fidelity, particularly when supported by shared procedures and structured decision-making tools (cf. Ng & Weisz, 2020).

Accordingly, *program effectiveness* varies to some extent. Some programs demonstrated significant reductions in disruptive behavior and improvements in prosocial skills (e.g., Hoogsteder et al., 2018, 2023), whereas others had little impact (e.g., Helmond et al., 2015). Some factors contribute to these variations, including differences in program integrity. For instance, although both Re-ART (Hoogsteder et al., 2018, 2014, 2016, 2023) and EQUIP programs (Helmond et al., 2015) incorporate cognitive restructuring, the outcomes diverged, with EQUIP showing no substantial reductions in recidivism. This disparity is more

plausibly attributable to implementation shortcomings than to weaknesses in the underlying theory. Indeed, EQUIP's fidelity was suboptimal – 25% of participants scored below 50% on implementation integrity, and only 15.5% surpassed 60%. In other programs, real-world constraints (e.g., limited financial and human resources, insufficient time to deliver sessions as intended, and youngsters' truancy, irregular attendance), as noted by some authors (e.g., Franco et al., 2016; Lipsey, 2018), emerged as a factor impacting the delivery of the program. These results echo meta-analytic evidence (cf. Andrews & Dowden, 2005; Goense et al., 2016; Mathys, 2017) that high implementation quality is a prerequisite for significant reductions in recidivism.

Our findings underscore that the programs' success is inseparable from the context in which they are delivered. Justice system programs continue to emphasize three tightly interrelated domains: emotion regulation (i.e., the identification, management, and expression of affect), cognitive restructuring (i.e., correcting social-cognitive distortions and maladaptive beliefs), and moral development (i.e., clarifying moral reasoning and ethical decision-making) (e.g., Re-ART, Hoogsteder et al., 2016, 2021, 2023; GPS-25, Rijo et al., 2013, 2020). School-based initiatives, by contrast, retain these foundational elements but expand their scope. In addition to emotion regulation and problem-solving, they frequently incorporate the development of personal and social skills through creative modalities (e.g., visual arts, music, drama) (e.g., Suh, 2023), as well as contemplative practices such as mindfulness (e.g., Franco et al., 2016). Community-grounded programs shift the emphasis further, prioritizing social support mechanisms, peer-mediated learning, and the cultivation of prosocial networks (cf. Srinivasan et al., 2023).

As expected, evidence suggests that interventions delivered in schools or community settings may be particularly effective for adolescents in the early stages of delinquency or those at low to moderate risk (cf. Avcioglu & Gokalp, 2023; Franco et al., 2016; Suh, 2023; Williamson et al., 2013). Notably, however, their benefits also appear to extend to relapse prevention. Promising preliminary follow-up data (cf. Akbas & Yigitoglu, 2022; Fung et al., 2013; Song & Kim, 2022) may further support this proposition, suggesting that contextual fit may serve as a critical moderator of long-term outcomes.

An optimal architecture for tertiary prevention must adopt an ecological perspective, integrating participants' risk levels and individual needs, as well as their characteristics and capacity to learn, while also accounting for institutional and contextual priorities and the temporal horizon necessary for meaningful change (cf. Koehler et al., 2013; Mathys, 2017). In juvenile justice settings, for instance, the prevailing priorities are rapid risk reduction and effective rehabilitation (Hoogsteder et al., 2018, 2023; Rijo et al., 2013, 2020). To meet these demanding conditions, practitioners frequently employ tightly focused, time-limited protocols. A prime example is the RE-ART program, whose group-based modules reliably reduce impulsiveness and overt aggression within the constrained timeframe of court-mandated placements (Hoogsteder et al., 2016, 2021). Even more compact variants have shown promising outcomes in enhancing self-regulation (Schippers et al., 2020).

For young people already involved in the justice system, a primary booster phase focused on emotional regulation, moral reasoning, and correcting cognitive distortions is often essential. We support prior meta-analytic evidence exhibiting the strategic timing of such interventions, particularly in the immediate aftermath of judicial adjudication (cf. Landenberger & Lipsey, 2005). We refer to these as booster modules because dosage and intensity must be titrated with precision. Makarios et al. (2014) demonstrated that while medium-to high-risk adolescents benefit from higher dosages than their lower-risk counterparts, both groups reach a threshold beyond which additional intervention paradoxically increases the risk of recidivism. In line with this ceiling effect, most programs identified in our review adopt a deliberately brief format, reflecting broader findings that shorter, more focused interventions often yield superior outcomes compared to extended ones (cf. Castillo Eito et al., 2020).

Yet brevity must not be conflated with superficiality, nor should it be treated as a recipe. Certain needs, particularly entrenched cognitive distortions, require more sustained intervention. When deeper cognitive restructuring is warranted, as has been noted in appraisals of the GPS-25 program, a justice-based, group-oriented, and multi-thematic intervention (cf. Rijo et al., 2013, 2020), subsequent extension modules should be implemented. Ideally, these should be delivered in school and community settings, where cross-context reinforcement enhances generalization. Our findings underscore the value of such extensive modules, which consolidate cognitive gains, support relapse prevention, and foster prosocial peer interactions. Indeed, coordinated cross-context approaches have been associated with steeper reductions in bullying and cyberbullying (Gaffney et al., 2019; Kovalenko et al., 2022), and are likely to yield parallel effects for tertiary programs for other disruptive behaviors.

Across all service settings, individualized calibration remains essential. Convergent evidence, including our own data and the synthesis by de Vries et al., 2015, suggests that hybrid formats, combining group-based and individual sessions, may constitute the most effective intervention strategy for youth. Group sessions foster a social learning environment that accelerates the acquisition of prosocial skills and emotion regulation, as evidenced by programs such as AMT (Srinivasan et al., 2023) and VPP (Zhou et al., 2018). In contrast, one-to-one sessions provide the privacy and intensity necessary for addressing entrenched cognitive distortions and regulating dysregulated affect – core strengths of RE-ART (Hoogsteder et al., 2018) and of high-intensity, clinically driven interventions such as the mental health-focused program evaluated by Derbyshire et al. (2019), which extended to approximately 300 h, a dosage justified by the depth of clinical concern.

Equally significant is the multimodality of intervention programs. Some meta-analyses (cf. Espenes et al., 2024; McCart et al., 2023) consistently demonstrate that interventions intentionally integrating cognitive-behavioral training with social learning mechanisms outperform single-modality approaches, regardless of whether they target a single theme or multiple domains. The synergistic combination of cognitive skill rehearsal (CBT) and peer-mediated reinforcement (social learning) appears especially well-suited to the multifactorial etiology of disruptive behaviors.

In terms of digital technology use, it bears emphasising that only three of the programs in our corpus incorporated any digital component (Braeuer et al., 2022; Jones et al., 2024; Ren et al., 2021), and just one reported a demonstrable gain, an improvement in anger-management skills (Braeuer et al., 2022). This stands in sharp contrast to mainstream child-and-youth violence prevention, where technology-enhanced delivery is gaining momentum (Esposito et al., 2024; Ingram et al., 2019) and has been associated with greater participant motivation and adherence (March et al., 2014). The synthesis reveals a striking gap: few tertiary programs for disruptive youth make meaningful use of digital tools, even in juvenile-justice settings, which constitute most of the programs analyzed in this review. Three factors are likely to contribute to this deficit. First, structural constraints and security challenges in institutional settings often hinder the adoption of digital tools. Indeed, some youths may face restrictions on their use (King et al., 2022). Second, disparities in digital readiness, including variable connectivity, a lack of trust in technology for communicating with adults, and unequal device access, undermine viability. Third, the field has lacked sufficient time and resources to rigorously evaluate pioneering digital interventions.

Before turning to the limitations, it is important to note that the quality appraisal of the present review is built on three interrelated aspects. First, the near-perfect inter-coder agreement indicates that the MMAT criteria were applied consistently, providing strong assurance that subjective bias did not influence the ratings. Second, 15% of the studies were classified as high-risk partly because their reports omitted crucial methodological details, particularly concerning randomization procedures, presentation of qualitative research protocols, and the

integration of qualitative and quantitative strands. More complete reporting might have moved these studies, as well as some moderate-risk ones, into lower-risk categories. Third, a sensitivity analysis indicates that even if all high-risk evidence were excluded, the results would remain virtually unchanged, suggesting that the review's overall conclusions are robust to any potential bias introduced by lower-quality studies.

5.1. Limitations and future directions

Despite the valuable insights provided by this review, it also has certain limitations that must be addressed. First, the exclusion of dissertations from the grey literature analysis may lead to publication bias (Paez, 2017), for example by limiting the possibility of analyzing more recent evidence, potentially including the evaluation of programs with digital delivered interventions.

Second, one notable limitation is the insufficient discussion of long-term follow-up data for some programs. In fact, in this body of research, only a small number of studies (n = 10) conduct follow-up assessments, making it difficult to thoroughly evaluate the persistence of intervention effects. While interventions such as LMV-E (Derbyshire et al., 2019) and Re-ART (Hoogsteder et al., 2018) demonstrated lasting behavioral improvements, other programs provided no data beyond the immediate post-intervention period, thereby limiting our understanding of whether observed reductions in aggression and delinquency endure over time. Future investigations should therefore incorporate extended follow-up assessments to better elucidate the long-term sustainability of intervention outcomes.

Considering the above discussion, stricter reporting protocols are needed, particularly for randomized trials, qualitative studies, and mixed methods designs, so that future researchers can access all the information required for rigorous evaluation.

Furthermore, most studies included participants from diverse national backgrounds, raising concerns about the generalizability of their findings across different cultural and socioeconomic contexts. It is crucial for future research to determine whether structured intervention programs are equally effective in varied cultural settings, especially in low-resource environments where access to structured services may be limited.

In addition, there is a need to evaluate multiple sources of effectiveness indicators. Only ten of the included studies utilized multiple sources to assess program outcomes, underscoring the importance of more robust and comprehensive evaluation methods.

While a larger number of methodologically comparable studies would be required to formally examine heterogeneity and potential moderators through quantitative synthesis, attempting such analyses at this stage would be premature. Instead, the present review explicitly acknowledges this limitation and frames heterogeneity itself as a key finding. The variability identified across programs, designs, and measurement strategies highlights the need for greater conceptual alignment, methodological consistency, and improved reporting standards in future tertiary prevention research.

Future research must go beyond identifying global effects and investigate for whom, and under which age-related conditions, each intervention component is most effective. Three critical dimensions remain underexplored: developmental stage, gender, and type of delinquency (e.g., offenses against persons, property crimes). Notably, head-to-head trials of modular intervention designs, along with the development of implementation frameworks that assist practitioners in selecting the most appropriate theme-by-context matrix for each youth, are essential. Consequently, it is crucial to reconceptualize intervention design from the outset to incorporate planned adaptability.

6. Conclusion

Although several of the findings synthesized in this review are consistent with conclusions reported in previous literature, the contribution of the present manuscript lies in its focused and integrative examination of tertiary prevention interventions targeting disruptive behavior across youth service contexts. Unlike earlier reviews that often combine primary, secondary, and tertiary prevention strategies or focus on specific intervention modalities, this one explicitly delimits its scope to service-based, post-onset interventions delivered to young people with established behavioral difficulties.

By systematically organizing evidence across heterogeneous programs, designs, and institutional settings, the review identifies recurrent structural patterns that remain insufficiently articulated in prior syntheses, including the persistent heterogeneity of outcome definitions, the limited consideration of implementation processes, and the scarcity of longitudinal follow-up. We acknowledge that these elements are not, in themselves, novel. Rather, the primary contribution of this manuscript is to update and re-examine these questions within a more recent and, to our knowledge, previously unreviewed time window. Importantly, this suggests that progress in resolving core methodological and implementation challenges has been slower and less substantial than anticipated. In addition, the review underscores a further, policy-relevant implication: despite the pronounced momentum toward the digitalization of youth intervention programs in recent years, the empirical base remains insufficiently developed to enable robust systematization or firm conclusions regarding the effectiveness of tertiary interventions.

Finally, we argued in favor of a modular architecture in which discrete, evidence-based units are sequenced to fit each young person's risk profile, the institutional mandate and the time needed for change. Justice-mandated programs housed in juvenile justice facilities can focus on urgent themes such as moral reasoning and impulse control through targeted modules, while parallel school-based interventions may reinforce skills through cooperative learning projects, mindfulness exercises, and similar activities. Community centers and after-school programs can further consolidate gains by offering prosocial peer activities that provide naturalistic rehearsal of newly acquired skills.

Effectiveness is maximized when these modular programs adopt a mixed-modality format that integrates group work with individual sessions, enabling deeper cognitive restructuring and addressing issues requiring privacy or greater therapeutic intensity, such as co-occurring mental health conditions. Moreover, continued evaluation of fidelity, modular intervention design, long-term outcome and the development of reporting protocols for qualitative and mixed-method studies on this area remain necessary.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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